

EDUCATIONAL INNOVATION AND RESEARCH AT THE CROSSROADS FOR CLIPPINGS IN SPANISH UNIVERSITIES

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Abstract

The severe economic crisis affecting the European countries, especially the Mediterranean watershed ones, is changing behaviours and demeanour that in the near future will make us think over. The best college generation of a country is looking for work abroad, because they cannot find it in the country where they were formed. The budgets for research, engines of development, are trimmed dramatically. The ability to develop consolidated research groups and educational innovative groups to analyse the combined problem of education, absenteeism, desertion, rates of success and failure is weakened by the lack of funds to support our universities and the lack of support from the regions that dramatically reduce its annual budget. Alike, the university's faculty is becoming more loaded with classes, being able to spend less time on innovation and research, pillars of the XXI century university. The latest cuts in 2011, 2012, 2013 and coming up in this 2014, marked this article that analyses the evolution of educational innovation funds in the recent years, the types and number of projects developed, the teachers involved and the results obtained. Conclusions merge to a point where a reflexion period, surrounded by difficulties must end in creativity, through innovation and research, nowadays affected to a degree of absolute instability.

Keywords: educational innovation, economic crisis, national accreditations, Bologna process.

INTRODUCTION

"Research is the foundation of teaching." Simply a short phrase in the Universities Act 2001 (Article 39.1), it changed outlooks, forged a change of criteria, and established a fundamental separation between professors.

A gap was discerned between the purely teaching professor, the technological and technical professional who enjoys teaching and gives lectures in technical schools, and the research professor who is more concerned with basic and applied science than with the classroom tasks that usually involve numerous groups and beginner courses whose complexity is considerable due to both expected learning outcomes and to the tension originated by the high number of teaching hours, the large breadth of content, and the lack of weekly periods designed to carry out other activities that are not purely academic.

Furthermore, the evaluations of the National Agency for Quality Assessment (ANECA) on teaching and professional activity were scarce: 35 points for national accreditations of Full Professor and 40 points for Associate Professor, in contrast to 55 and 50 points for research, where at least 24 indexed publications to the first figure were required, and a minimum of 12 for the second one, on the basis that every six years of research amounted to 15 points. [1]

A training model was questioned, one which was based on the optimal synergy of professional and research experience, and whose effectiveness was beyond doubt as evidenced by the emerging professionals from these schools, who are able to perform civil works such as the Panama Canal (Sacyr), the Seattle tunnel (ACS - Dragados), the TGV Medina - Mecca (OHL) or ports like Açú in Brazil (Acciona) [2].

Our best generation of qualified, well-trained professionals and engineers are "condemned" to look outside for human solutions and vital development, often because of a lack of planning in infrastructure, education and research, which are three of the cornerstones of a progressing society.

On these premises, where the college professor adapts to new technologies in a chameleon-like manner, a new branch appeared within the engineering curriculum: educational innovation.

The Technical University of Madrid (UPM), as part of its plan of continuous improvement of activities and quality of education, launched in 2005 the Educational Innovation Projects, which despite cuts, frustration, and economic difficulties have led to a deeper insight into the perspective of the professor and the "client", our students, the *raison d'être* of the university, in view of a high-level of training.

METHODOLOGY OF UPM – EDUCATIONAL INNOVATION AND RESEARCH

As the Spanish writer and poet Antonio Gala says "Nothing underscores a lack as much as the attempt to hide it ". Confucius said, "A man who has committed a mistake and doesn't correct it, is committing another mistake".

The solution for a crisis cannot be considered without training, research and innovation. Any cut in this area is dramatic. Working groups take years to consolidate and to give results, but they are dissolved in an instant, shifting from pleasure to guilt, from prosperity to starvation. At this time, if our hearts as teachers began to think, they would cease beating.

The different educational plans of UPM, in reference to the policies of educational innovation, had a number of evident targets, based on the student support gained at a period of economic stability, among which the following stand out: [3]

OBJ1 To improve the academic integration of new students, addressing their diverse situations.

OBJ2 To improve the efficiency of acquisition of learning outcomes from students.

OBJ3 To improve the systems of assessment and qualification.

OBJ4 To decrease absenteeism and abandonment.

OBJ5 To reinforce the practical orientation of our teachings.

OBJ6 To integrate academic training and assessment in transversal competences with preparation in specific competences.

OBJ7 To take advantage of new opportunities that Internet provides in order to enrich the educational process.

OBJ8 To facilitate alternative means that make learning easier for students enrolled in Plans that are in an extinction phase.

OBJ9 Others

The evolution of our country and the alarming levels of unemployment among young people led to a raise in the objectives that were based on improving language skills, business practices, and job entry, providing greater opportunities for our students and "exhausting" our teachers even more, who are increasingly concerned about students and the fewer resources that are available as a result of project cuts and State guidelines based primarily on the "fact" that "**public officials are responsible for the crisis**", who see their salaries, allowances, bonuses and wage increases systematically reduced, in order to maintain their jobs secure.

In the year 2012, the number of general performance objective is expanded in the context of educational innovation, indicating that the propositions made by professors should be associated with one or more specific actions. The new targets include: [3]

OBJ4 To create resources and to implement initiatives that support the training of students in the acquisition of a B2 level in the English language.

OBJ9 To develop repositories of practices, teaching resources, and activities that facilitate experimentation as well as independent learning.

OBJ10 To facilitate alternative means that make learning easier for students enrolled in Plans that are in an extinction phase.

OBJ11 To develop methodologies of monitoring and mentoring of external internships of students and of mobility programs.

OBJ12 To favor employment through systems of employment orientations and program to favor the enterprising spirit of students and graduates of UPM.

We should note that in Spain (and in all of Europe) a change in the university education model took place in the year 2010, which has been called "Bologna Process" and encourages and aims to improve teaching and student mobility in a "Single European Space." It only suffices to observe that in the year 2012-2013 we have the same investment levels as in 2006-2007 (Table 1). This is absolutely disheartening, as we have shifted from the "old" Plans to the new space with Higher Education Bachelors and Masters, and the number of degrees at UPM has gone from 22 to 41 bachelors and over 80 enabling and university masters.

Table 1: Financing in Educational Innovation Projects at UPM. Academic years 2005-2006 to 2012-2013.

	Projects		Financial funds	
	Applied	Granted	Applied	Granted
2005	57	38	231,778 €	124,791 €
2006	121	97	953,184 €	600,222 €
2007	135	118	972,355 €	872,220 €
2008	168	105	1,930,588 €	858,233 €
2009	183	108	1,607,644 €	857,907 €
2010	217	170	966,221 €	795,248 €
2011	215	212	899,023 €	815,723 €
2012	205	201	651,032 €	546,692 €
Total	1301	1049	8,211,846 €	5,471,036 €

Throughout the eight Educational Innovative Projects support calls initiated in the academic years 2005-06 through 2012-13, the overall project funding amounted to €5,471,036. This amount has been distributed among 1,049 approved projects, representing 80.6% of all projects submitted (1,301), and 66.6% of the funding requested (€ 8,211,846) (Table 1). [3]

Looking at the data of the average funding allocated to projects of the last three calls (Table 2 and Figure 1), we observe that the amount of projects decreases along alarming levels. What can be done with 1.500 Euros?

Table 2: Average funding of projects in academic years 2010-2011 through 2012-2013.

	Average funding of "Center projects"		
	Center coordinated	GIEs Projects	Other projects
2012	1.905 €	2.970 €	1.495 €
2011	2.402 €	4.543 €	1.786 €
2010	3.707 €	4.297 €	2.618 €

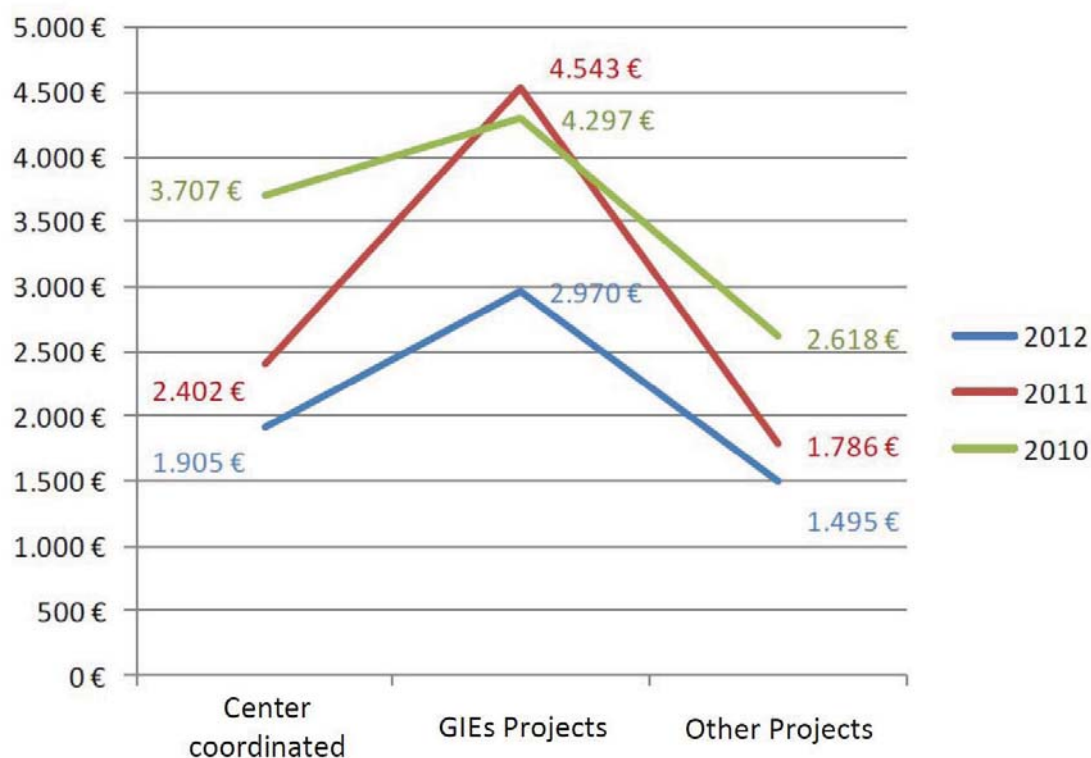


Figure 1: Average funding of projects during academic years 2010-2011 through 2012-2013.

In addition to the amount of our projects, the number of interns has decreased too (Figure 2).

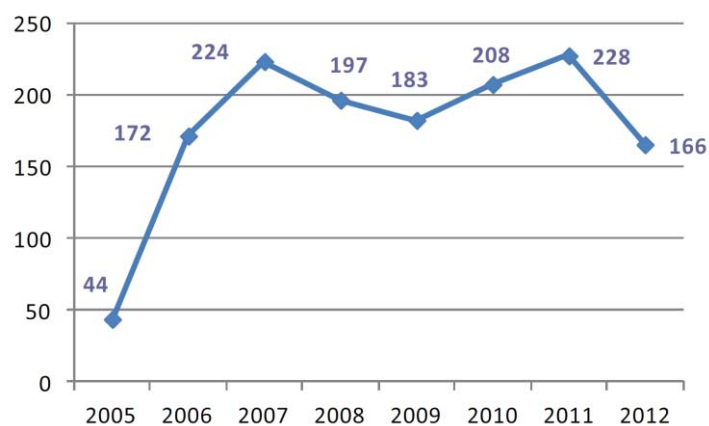


Figure 2: Number of approved interns, by calls.

At this juncture, teaching is almost an "irrelevant" activity; the professional activity is dispensable; and research is the spearhead of accreditation, so the gap separating university teachers is widening.

Nevertheless, the number of professors involved is higher and Educational Innovation Groups (GIE) at UPM have grown (Figure 3), which poses the following questions: Is it curricular engineering? Is there a need for merits in order to gain accreditation? Or is it necessary to show sensitivity to absenteeism, abandonment, and the potential placement of our students? These questions are difficult to answer at any given university forum since responses are masked according to the field, the discussion forum, and the personal situation of the respondent.

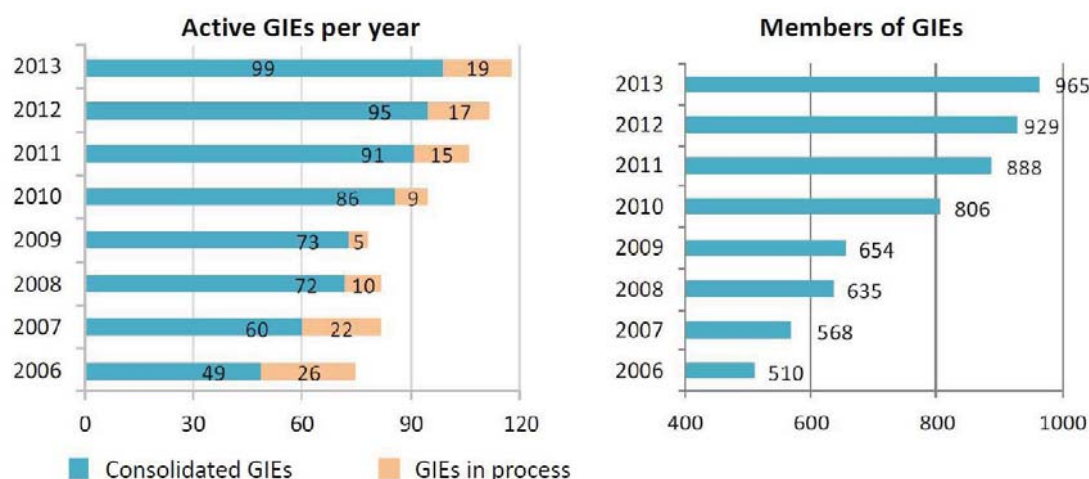


Figure 3: Statistic of GIEs in UPM.

Despite this situation the Technical University of Madrid is still committed to a high level education of our students and has gathered actions along the following strategic lines (Figure 4):

LÍNEA 1	Development of new methods of learning and assessment
LÍNEA 2	Attention to students
LÍNEA 3	Curricular development
LÍNEA 4	Integration of IT to classroom teaching
LÍNEA 5	Coordination of educational programs University/Baccalaureate/Professional Training
LÍNEA 6	Development of the teaching dimension of I+D+I projects
LÍNEA 7	Institutional lines
LÍNEA 7A	Adaptation of teaching organization
LÍNEA 7B	Acquisition and retention of students
LÍNEA 7C	International agreements
LÍNEA 8	Others

Figure 4: Strategic Lines of the Technical University of Madrid.

The exposition of this series of data clearly shows a changing model of academic curricula and a new profile of professors, having marked scientific tendencies, a decreased technological and professional profile, and no resources to convey their experiences in the field of pedagogy.

And so, a new question arises in our aim to envision a better future for our graduates: Who designs a bridge better, the designer of a technical office that has spent his entire career projecting them or the researcher in finite elements of thermal stress on the board? Who will give a class to students on fertilization better, the doctor who has performed more than 10,000 births or the researching doctor of a laboratory specializing in 37 week's deliveries?

CONCLUSIONS

During the last eight years the Technical University of Madrid, in its commitment to excellence, has shown interest, concern and continued commitment to improving the quality of education in its schools and curriculum programs of Bachelor and Master.

Educational Innovation Projects developed to date have had a great concern for students; for their abandonment, their absenteeism, their need for improved expression in foreign languages and in practices in business and employment.

The lack of resources due to the dramatic crisis of 2008 – 2014 is causing Educational Innovation Groups, whose assembling and delivery of results takes time, to dissolve or to cease producing.

A country must be based on the three basic components of education: research, career, and teaching. Without these three pillars, stability begins to suffer. The Spanish university has been fundamentally oriented to research. Whether this focus is a mistake in engineering disciplines is not known, but the future will dictate its results.

Educational innovation emerges as a new model of research in the classroom, but the low level of funding and the need to enlarge the curriculum of some professors, is causing it to suffer deeply.

To conclude, we emphasize the "gap" that is developing between three accentuated university teacher profiles: a) the educationalist, professional and enthusiastic professor; b) the technological and technical professor, and c) the research professor.

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